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ABSTRACT

A study investigated whether there would be a significant improvement in the reading comprehension test scores of hearing-impaired secondary school students if their content area subjects included closed captioned television lessons. Subjects, eight students in an experimental group and five students in a control group, were grouped according to reading level. Three randomly chosen teachers showed the captioned TV program, offered reading instruction, and then showed selected parts of the program again or used the script to reinforce specific skills taught. Afterwards, both groups were tested for comprehension. Results showed no significant effect for the use of captioned television to enhance reading comprehension of hearing impaired adolescents. However, the experimental students were motivated to read more, and by the fifth week of experimentation, some of these students read more fluently. (Tables of data are included, along with a review of related research as well as a 28-item reference list and four appendices.)

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"Do Closed Captioned Lessons Enhance Reading Comprehension in the Hearing Impaired Adolescent?"

by

Linda Putz

Presented in Partial Fulfillment
of the Requirements for the Master of Arts Degree

Kean College of New Jersey

May, 1987

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ABSTRACT

This study involved thirteen secondary hearing impaired students, who ranged in age from 13 to 18 years. It was hypothesized that there would be a significant improvement in the reading comprehension test scores of these students if their content area subjects were to include Closed Captioned Television Lessons when compared to a sample who were not similarly instructed.

An analysis of the results indicated that there was no significant difference in the reading comprehension test scores of the experimental group when compared to the control sample.

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The technological development of closed captioning has had a tremendous effect on the lives of the hearing impaired individuals. Hearing impaired people of all ages are enabled to communicate more freely with their hearing peers as they share information and entertainment viewed on the television screen. Hearing impaired adults are able to participate in political events, such as voting for the President of the United States. Before closed captioning was available, most deaf adults did not know what the candidates were promising and did not vote. Captions have made this possible.

Educators and parents identify positive psycho-social results of using closed captioning. They indicate that the children are more aware of what is happening in the world.

Educators of the hearing impaired adolescent cite benefits of using closed captioned lessons with their students. The captions are motivating and offer reinforcement of sight vocabulary. Captioning offers a potentially positive learning experience to their students.

The results of recent studies indicated positive support for the use of captioned T.V. in the teaching of reading to hearing impaired students. Nugent (1983), for example, indicated that both hearing and non-hearing students can learn from both visual and print presentations, but a combination of the two produces the greatest achievement. Block and Ohrand (1983) cite Stepp and Caldwell (1981). They indicated that vocabulary development, the opportunity to observe good sentence structure and motivation

for reading were three influential educational advantages for using closed captioned T.V. lessons.

Patricia Koskinen and Robert Wilson (1986) conducted a study to ascertain whether closed captioned television could be used in the teaching of reading to hearing impaired students. The experimenters noted that one potential application of closed captioning is it's use as an educational tool in the teaching of reading to hearing impaired students and to diverse hearing populations.

Koskinen and Wilson studied 41, severe-to-profoundly deaf, 13 to 15 year old students with a first to third grade reading level. The eight teachers who participated in the study cooperated in two initial training sessions on how to use captioned film programs as lessons. The teachers were shown portions of closed captioned T.V. programs and given lesson suggestions for developing vocabulary and comprehension skills.

A true experimental ABAB design was used. (A-1) was the data collected during three to four instructional reading lessons to establish a baseline. (B-1) was the data collected during six to eight closed captioned T.V. reading lessons. (A-2) was the data collected during two closed captioned T.V. reading lessons. A teacher rated 5 point Likert scale ranging from poor (1) to excellent (5) was used.

Teacher perception of the student's general comprehension and interest in individual lessons can be considered and extraneous variable since there was no formal evaluation of these.

This study implies one potential benefit of using closed

captioned lessons with secondary hearing impaired students: that there might be an indication of an increase in reading comprehension over those who have not had this experience.

HYPOTHESIS

To add information on this point, the following study was undertaken. The hypothesis title has that closed captioned television lessons produce greater reading comprehension scores in the hearing impaired adolescent, when compared to a sample who are not similarly instructed.

METHOD

Subjects

Two teachers and eight students served as the experimental sample while one teacher and five students served as the control sample. Students ranged in age from 15 to 16 years with reading levels ranging from 2.8 to 6.5. These students are moderately to profoundly deaf and in most cases the onset of deafness was at birth. They were heterogeneously grouped in small classes of four to eight students according to reading level. The three teachers, randomly chosen, were given instruction to use a half hour captioned t.v. lesson prior to the actual use of the captioned T.V. for instructional purposes.

Procedures

Captioned T.V. reading lessons were prepared using videotaped programs. A series of video packages were assembled for use in this project. The series consisted of video cassette closed captioned programs and a teacher's observations packet to note

student's behavior and understanding of viewed material. The reading activities focused on a portion of the program and consisted of the following parts:

a. viewing the captioned T.V. program

b. instruction in reading comprehension

c. viewing the selected parts of the program again or using the script to reinforce specific skills taught.

Data were gathered and analyzed through the admininstration of the Stanford Achievement Test, Form E, Primary 2 and Primary 3, Intermediate 1 and Intermediate 2, which are normed for hearing impaired students with reading levels of 2.5 to 7.9.

The subtest for the Primary 2 Level began with three short passages presented in a multiple choice, modified cloze format. This simple format was able to encourage students to respond in a way that approximates the reading process. The remainder of the test consisted of seven complete passages with accompanying multiple choice questions for a total of 40 questions.

The subtest for the Primary 3 Level measures comprehension as it relates to the type of material read and to the particular questions asked. The test consisted of 11 complete passages and 60 multiple choice questions related to these passages. The questions were designed to tap the literal and inferential comprehension skills.

The subtest for the Intermediate 1 level consisted of 8 passages and 60 multiple choice questions related to these passages.

The Intermdiate II subtest consisted of 10 complete passages and 60 multiple choice questions related to these passages.

RESULTS

An analysis of the results in Table I indicate that the experimental evidence is limited by the fact that the groups

TABLE I

Test Data Prior to the Experimenting Period

Sample	Mean	Standard Deviation	t
Experimental			
N=8	3.25	.58	7.23
Control			
N=5	5.36	1.33	

were not balanced academically, at the outset of the study. The control group was a much better group academically and therefore could be expected to achieve positively after further instruction. The disparity between the mean achievement of the samples suggests that the members of the control sample might not have been randomly assigned.

The results as seen in Table II indicate that, when the samples

TABLE II

Mean Gain of Samples Following Experimenting Period on Reading Comprehension

Sample	Mean	Standard Deviation	t
Experimental			
N=8	.1	.95	.62
Control			
N=5	.42	.83	

were categorized according to their age, the experimental sample consisted of 8 students, 15 to 16 years of age and the control sample consisted of 5 students, 15 years old.

The mean gain over the eight week period for the experimental sample is seen to be a median one month experiment in comprehension while the control sample made slightly more than four months growth in comprehension. The t indicates that neither sample achieved significantly better than the other. The numerous negative scores (see Appendix A) in terms of gains indicate regression to the mean effects of short interval testing.

CONCLUSIONS AND IMPLICATIONS

While previous research reports support the use of captioned televison in the teaching of reading to hearing impaired students, the data gathered from this research project indicated no significant difference in the use of captioned t.v. to enhance reading comprehension in hearing impaired adolescents.

When the project was originally set up the samples were to have been chosen randomly. Due to the experimental environment, the samples were not randomly chosen, therefore affecting the results of the experiment.

The teachers who used the closed captioned t.v. for instructional purposes also noted specific observations of the students during the instructional period. Students were given captioned films related to science. When unknown vocabulary words appeared on the screen, students questioned the meaning of these words. An example was "Salt marsh." The student asked, "Salt marsh... what do you mean?" One teacher also noted that the pictures

seemed to help the students read some words in the context of sentences that were unfamiliar to them, e.g. "quills" on the porcupine, on the screen.

Students remembered certain concepts presented, such as rock erosion and were able to discuss the procedure openly.

The students were motivated to read more and by the fifth week of experimentation, some of the students' fluency in reading had improved, according to the teachers.

The implications, therefore, for using closed captioned television to enhance reading comprehension are positive. Perhaps with a wider and randomly chosen sample, and an expanded time period, the results would have been more positive.

RELATED RESEARCH

In 1972 Boyd and Vader completed initial research on captioned television for the deaf. They identified that if captions are appropriately written with regard to the linguistic level and reading rate of viewers when added to a television program they can contribute significantly to the acquisition of information. Since children watch approximately 22,000 hours of television by the time they have reached adolescent age (Good, 1973) it is understandable that captions would enhance the linguistic level and reading rate of viewers.

Jackson (1974) cites Charles B. Klash as saying: "The medium of television...now holds the greatest promise as the delivery system of a myriad of instructional materials which must reach the classroom for use by student and teacher at the critical learning moment." Hamilton (1976) indicated that students give more time to television than to reading. Children will read when their interests are stirred. Teachers can make contributions to pupil's development by offering guidance as well as by recognizing and using interest in television to motivate instruction.

Stoefan (1980) cites Trybus and Karchmer (1977): they used the Stanford Achievement Test (special edition for Hearing Impaired Students). They found discouraging results in reading comprehension: "half the students at age 20 (or at any younger age) read at less than a mid-fourth grade level, that is below or barely at a newspaper literacy level." Cronin (1980) indicates that captioning can help bi-lingual children and adults, reading disabled and disadvantaged children to improve their reading skills.

Frequently quoted statistics indicate that few deaf children

learn to read above a sixth grade level. (Coley, 1980). The study conducted by Coley (1980) examined reading instruction and sought answers to the following questions: a) What is the extent of current teacher training with respect to reading instruction? b) What methods are now used to teach reading to hearing impaired children? c) How well prepared do teachers say they are in using a variety of methods to teach reading? The first two questions have been studied in depth by other researchers. Results indicate teachers did not have much formal course work training which lead to the use of a variety of techniques. Researchers also found that basal series were the primary source of instruction.

Results of this study indicate that teachers use techniques with which they feel well-prepared. It is interesting to note that 58.7% of the teachers questioned did not experiment with other modes of enhancing reading in the hearing impaired youngsters. The majority (63.8%) of the teachers use individualized reading instruction 1 - 25% of the time.

Reading print on paper is essentially a different task from reading captions on television. Many of the challenges of reading captions on television come from the instability of the caption display: Captions are faster moving and therefore the reader's rate is ruled by the amount of time each caption stays in view. During normal reading on paper, the student can go back to comprehend information, correct misunderstandings and retrieve previous information. (Decker, 1980).

The researchers Shroyer and Birch (1980) attempted to study the reading rates of hearing impaired children in representative schools for the deaf in order to determine a guideline for reading

rates of captioned films and television programs.

Results of this research indicated that students are likely to be able to understand most material that is below their own difficulty level when they read it at their usual reading rate. When students are given material at a level of difficulty that is above their own level of ability, then they probably will not be able to comprehend what they are reading if they read it at their usual rate. Rate will be affected by the difficulty of the material.

Braverman & Hertzog (1980) conducted a study to identify the effect of caption rate on comprehension and the effect of varying caption language level on comprehension.

The researchers used two language levels;Level I which was restricted to second grade readers. The vocabulary of Level III was that of fourth grade hearing readers.

Results indicated the caption rate did not significantly affect comprehension of global, explicit, or inferential information. But at Level I students generally scored lower as the rate increased.

The language level did significantly affect explicit and inferential comprehension.

The study supports the idea that re-writing captions at a lower language level will help comprehension of a television program by a deaf viewer.

The studies indicate a need for more teacher training in the many modes of teaching reading to the hearing impaired, including using closed-captioning as a supplemental medium. It is interesting to note that Andrews (1980) reported on a survey

of deaf adolescents administered within their peer groups. Eighty-five percent of the boys and girls questioned agreed that there should be more captions on television and in the classroom for educational purposes.

Graham and Laysen (1980) recommended the use of a lesson guide to reach full potential of captioned educational films. The authors identify the main parts of a lesson guide as: a) foreward, b) utilization guidelines, c) table of contents, d) list of films withing a particular edition, e) individual film lesson guides, f) subject heading index, and g) alphabetical title index. The authors suggest that if the lesson guide is followed it will:

1. provide more knowledge of film content before viewing the film
2. provide an improved relationship between classroom lesson content and film content
3. promote integration of films
4. provide for improved student comprehension of film content and concepts
5. promote improved overall lesson content since the guide serves as a source of teaching ideas and resources beyond the use of the film only

Jensema and Fitzgerald compiled information from questionairres distributed with the purchase of a caption-coder. The information received from these questionairres indicates that closed caption television has moved from initial research to an operating system with vast potential benefits for millions of hearing impaired people.

The closed caption television system can be the greatest advance in the education and entertainment of the hearing impaired. (Jensema, 1980). Boatner (1981) recognizes that captioning films began as a source of entertainment for the hearing impaired population. It has now expanded to serve various needs.

Reading is the primary tool for developing independence in learning. When the hearing impaired student is voluntarily and eagerly watching captioned T.V. shows they are engaging in the complete act of reading with it's many dimensions and functions. (Caldwell, 1981). Liss and Price (1981) indicate that it is quite clear that deaf children enjoy television, even more than hearing children do, and that T.V. might be used to some advantage in their education. Educators and media specialists in schools for the deaf across the United States have reported that their students voluntarily and eagerly watch captioned T.V. shows repeatedly to grasp the words on the screen. (Caldwell, 1981) Deaf adults have noted increases in vocabulary as they jot down unfamiliar words while viewing captions and later look those words up in the dictionary.

One year after closed captioning became nationally available, a survey indicated that administrators of programs for the hearing impaired overwhelmingly felt closed captioning would benefit the educational process in the classroom. Teachers in these programs noted that captioning had helped improve students' language skills and motivated them to read more. (NCL, 1981).

Fitzgerald and Jensema (1980) conducted a study to identify the closed captioned viewing audience's preferences. The subjects

indicated they are satisfied with the captioning services available and that they prefer to watch "movies" and the "news." As Blatt and Sulzer (1981) note the Captioned ABC News attracts a large viewing population. These same authors also identify the need for further investigation into captioned television effects. Especially the effect captions have on entertainment, education, and socialization in a culture saturated with television viewing.

Braverman (1981) identifies major findings through various completed research. Braverman cites research as indicating that viewers reading up to the third grade level have more difficulty with captions. Research indicates that language level of the captions will have an effect on the comprehension of the captions. Reading rate is also a concern. It has been researched and found that youngsters are able to comprehend a television program when captions are presented as fast as 120 words per minute. A third concern reviewed was the fact that it is not necessary to synchronize audio and captions to insure comprehension of the captioned television program for viewers with some residual hearing.

In understanding the teaching of reading to the hearing impaired youngster it is perceived that the student approaches the beginning reading process by recoding. (Hammemeister, 1983). However it has been suggested that most hearing impaired readers change print to a pure visual code. Graphic symbols are recoded as lip movements, signs, or fingerspelling, depending on the nature of the child's internalized language systems, they still use essentially similar strategies for processing written information. It is suggested that methods of reading instruction appropriate for hearing child-

ren may also be applicable to hearing impaired children.

In 1983, the National Captioning Institute, conducted a project to determine if captions are differentially effective for students of varying reading levels. The students in this research project were asked to watch the program "Happy Days" carefully. After viewing the program, each student was asked to complete a multiple choice test on the program's content.

The results of this study confirmed teacher's observations about the benefits of closed captioning television. It was confirmed that captions support hearing impaired children's understanding of television content at varying levels.

Gwen C. Nugent (1983) sought the answers to these questions: Do students attend primarily to the caption or to the picture, or do they employ a scanning/switching strategy that enables them to attend to and assimilate both? Is there an interference or summation effect between captions and visuals? The major emphasis was to determine where students obtain information from captioned presentations-- the visual, the caption, or an interaction of the two.

The students were given instruction in the following manner; visuals plus captions, visuals alone, and captions alone. The findings indicated that learning can be improved by captioned instruction. The research indicated that the use of pictures had obvious advantages and captioning could improve the learning of pictorial information. The findings emphasized the importance of visuals and captioned instruction in deaf education, indicating that an effective instructional format combines both.

Educational projects started to experiment with captioned television as a way to develop skills in reading vocabulary, oral reading fluency, and comprehension. (Wilson and Koskinen, 1986). To examine the promising uses of captioned television, projects were enacted in three Maryland public schools. The instructors used captioned television as a way to teach reading in three different classrooms.

One classroom had remedial readers, another had students who spoke English as a second language and a third had hearing impaired students. The results were similar. Student motivation was very high and teachers found many opportunities to develop reading vocabulary in interesting ways. After viewing a short term portion of a show several times, pupils could read many of the captions fluently and student comprehension improved. (Wilson and Koskinen, 1986).

Some students benefit from the instructional use that stresses comprehension before the actual reading of words. This changes the process that many students have been exposed to in learning to read and it appears to make learning easier.

A majority of projects mentioned in the literature used captioned television for reading instruction by producing lessons relative to the television shows. Results of these studies indicate that using captioned television at home for regular television viewing could encourage students to improve their reading vocabularies (Wilson and Koskinen, 1986).

Koskinen, Wilson, and Jensema (1986) indicate that reading and language skills are the key to successful learning in all

academic disciplines and are essential in the world of work. Deaf people find themselves at a great disadvantage in relation to the rest of society. Instructional and technological variation appear to have sufficient potential for positively influencing the reading skills of such hearing handicapped people.

The project Koskinen, Wilson, and Jensema undertook was to explore the strengths of capitalizing on deaf students' interest in watching closed captioned T.V. by using this mode in their instruction reading program. Of particular interest was identifying the effect of closed captioned T.V. on students' sight vocabulary and comprehension.

Teachers compared their regular reading lessons, which concentrated on vocabulary and comprehension instruction, with captioned T.V. lessons, which focused on the same skills. Of the 41 students who participated in the project, 9 students scored poorly on sight vocabulary retention. Approximately 10% more sight vocabulary was retained in the two instructional settings where closed captined T.V. was used than in the two instructional settings where regular instruction was used.

The results of the study indicate positive support for the use of captioned T.V. in the teaching of reading to hearing impaired students. The researchers noted that since a strong sight vocabulary is necessary for comprehension of print, closed captioned T.V. can be thought of as an asset to comprehension. Teachers also supported this report and added increased motivation and the quality of learning.

Findings such as these merit further research to answer

the question: Does closed captioned program viewing enhance reading comprehension in the hearing impaired adolescent? The Caption Center News encourages educators to take advantage of the potential of captioned T.V. as a creative supplement to the school curriculum. (Fall, 1986). It is desirable, certainly, to determine whether such usages produce significant change and thus meriting appenditures of resources in time.

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APPENDICES

Appendix A

Grade Equivalents of Pre and Post Tests

Control Group

Pre-test Data	Post-test Data
3.2	4.0
5.0	5.6
6.0	6.1
6.1	7.5
6.5	5.7

APPENDIX B

Grade Equivalents of Pre and Post Test

Experimental Group

Pre-test Data	Post-test Data
2.8	3.7
2.8	3.8
2.9	2.9
2.9	3.7
2.9	3.8
3.5	2.8
3.9	2.4
4.3	3.7

APPENDIX C

Gain in Grade Equivalents

from Pre and Post Tests

Control Group

Subject	Gain
1	.8
2	.6
3	.1
4	1.4
5	-.8

APPENDIX D

Gain in Grade Equivalents

from Pre and Post Tests

Experimental Group

Subject	Gain
1	.9
2	.1
3	0
4	.8
5	.9
6	-.7
7	-1.5
8	-.6